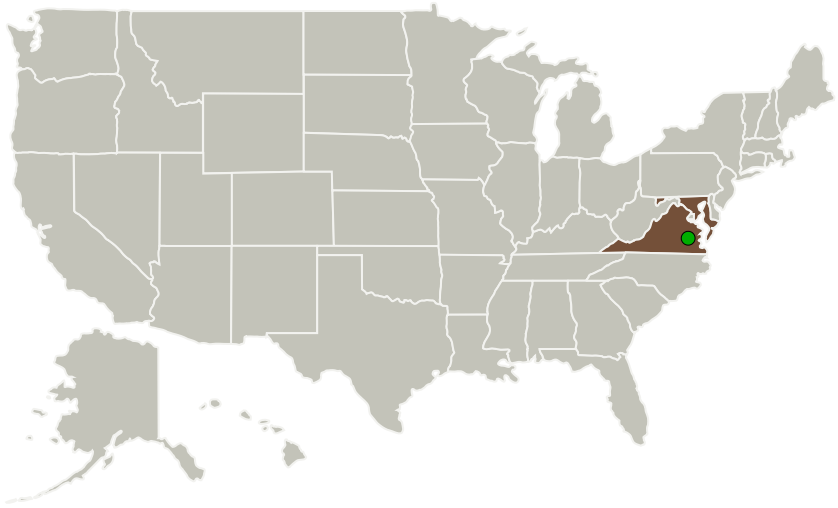
Networked ATM for Efficient Routing, Phase I

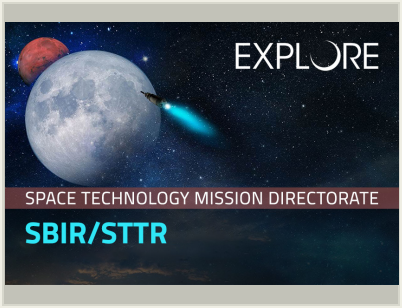
Completed Technology Project (2015 - 2015)

Project Introduction

Uncertainties in weather forecasts and traffic congestion sometimes result in inefficient planned flight paths for aircraft operating in the National Airspace System (NAS). Over the past several years, NASA developed two decision support tools to identify opportunities for efficient re-routes. The Dynamic Weather Routing (DWR) system uses information generated on the ground to identify candidate flights for re-routing and the airline operations center (AOC) sends the proposed change to the flight deck for subsequent negotiation with air traffic control (ATC). The Traffic Aware Strategic Aircrew Requests (TASAR) system is flight deck-based, using information available on the aircraft and software in the electronic flight bag (EFB) to suggest alternative routes. DWR successfully completed operational tests at ZFW and American Airlines and TASAR will soon begin operational evaluations at Alaska Airlines and Virgin America. Our concept proposes a more capable architecture that can take full advantage of emerging communications technologies to integrate AOC and flight deck capabilities. This approach offers a more robust, extensible architecture that can be tailored to an individual airline's operational model while simultaneously offering an upgrade path for adding more capability over time. Our solution aims to combine the best features of DWR and TASAR and adds more capability via enhanced data communications. Our solution fully integrates with the AOC but retains full access to the superior information from the flight deck. This enables our architecture to use the best available data, allocate data processing and analytical functions to where they can be performed most efficiently, and allows the airline to choose where it wants decision making to occur.

Primary U.S. Work Locations and Key Partners





Networked ATM for Efficient Routing, Phase I

Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

Networked ATM for Efficient Routing, Phase I

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Organizations Performing Work	Role	Type	Location
Robust Analytics	Lead Organization	Industry Women-Owned Small Business (WOSB)	Crofton, Maryland
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Maryland	Virginia

Project Transitions

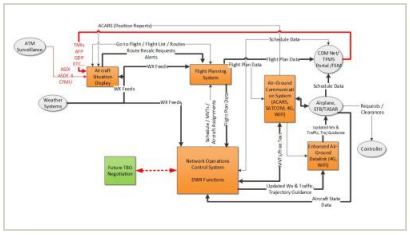
June 2015: Project Start

December 2015: Closed out

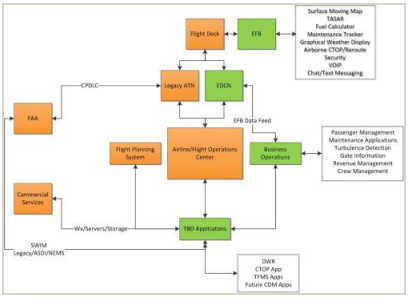
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139162)*

Images



Briefing Chart
Networked ATM for Efficient Routing Briefing Chart *(https://techport.nasa.gov/image/136491)*



Final Summary Chart Image
Networked ATM for Efficient Routing, Phase I Project Image *(https://techport.nasa.gov/image/135048)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Robust Analytics

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

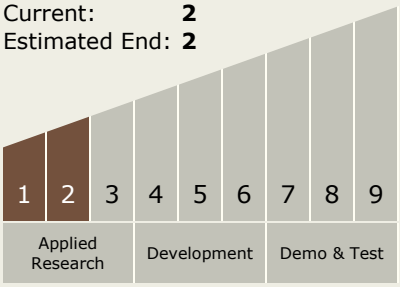
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Peter F Kostiuk

Technology Maturity (TRL)

Start: **1**
Current: **2**
Estimated End: **2**



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Completed Technology Project (2015 - 2015)

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.5 Revolutionary Communications Technologies
    - TX05.5.2 Quantum Communications

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System